

***Infrared Spectral Studies of Asteroids***

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***Strategy***

The research objective is to improve our understanding of the surface mineralogy of asteroids and to link the vast existing body of meteorite geochemical data with specific astronomical objects which may be the targets of future NASA missions. The methodology employed is 1) use advanced astronomical instrumentation to obtain reflection spectra in the 0.3-5.2  $\mu\text{m}$  wavelength range of selected asteroids; 2) compare the asteroid data with similar data on simulated asteroid regoliths of various compositions to determine the surface mineralogy and meteoritic affinities of asteroid spectral classes and specific asteroids; 3) intergrate the mineralogical information with other astronomical data, orbital dynamics studies, and meteorite geochemistry data to reconstruct the condensational, thermal, and collisional history of the present asteroids and their parent planetesimals; 4) use the information obtained to assist planning of future NASA asteroid missions such as Galileo and CRAF.

***Progress and Accomplishments***

Continued to observe selected members of the Eos family and other suspected K-class asteroids; provided information for selection of candidate asteroid flyby targets for Galileo and CRAF missions; designed and purchased interference filters for future broadband asteroid survey.

***Projected Accomplishments***

Begin observations for moderate resolution IR asteroid survey; aquire 52-color spectra of selected S-type asteroids, Earth-crossers, members of asteroid dynamical families, and suspected K-types; continue to assist planning for Galileo and CRAF mission asteroid flybys.

***Publications***

Thomas, P., D. P. Cruikshank, J. F. Bell, J. Veverka, and J. Lunine, Mars satellites: Geologic history. To appear in MARS, University of Arizona Space Science Series (in press).

Cruikshank, D. P., D. J. Tholen, W. K. Hartmann, J. F. Bell, and R. H. Brown, Three basaltic asteroids and the source of the basaltic achondrite meteorites. *Icarus* **89**, 1-13 (1991).

Cruikshank, D. P., W. K. Hartmann, D. J. Tholen, J. F. Bell, and R. H. Brown. Basaltic achondrites: Discovery of source asteroids. *Meteoritics* **24**, 260.